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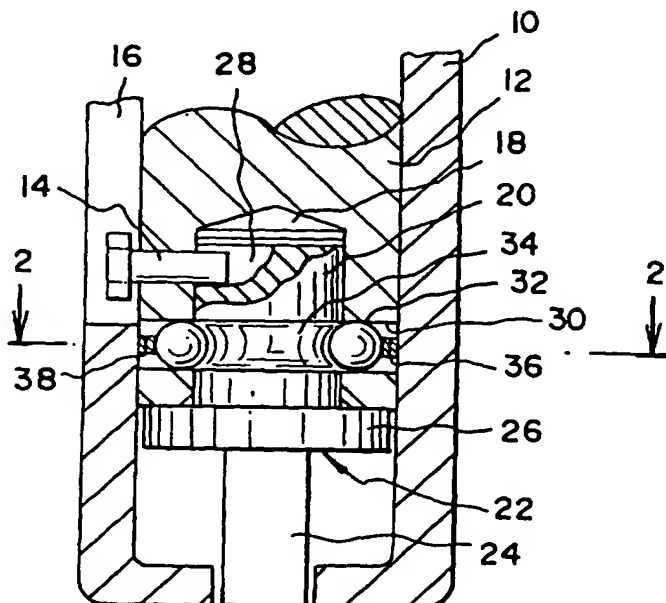
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(54) Title: PUNCHING TOOL



(57) Abstract: A punching tool has a guided, axially displaceable die plunger 12, which is fixed against relative rotation, in a guide bushing 10. In a bore in its front end a punching die 22 is seated. During the punching stroke the punching die rests against a front face of the die plunger and is axially fixed in place by means of one or several snap-in balls 32, each of which is seated in a transverse bore 30, which snap-in balls are maintained in engagement with an annular groove 34 by means of a spring washer 36 in the die plunger. The outer diameter of the spring washer is only slightly less in the engagement position than the inner diameter of the guide bushing and can be elastically widened for releasing the punching die outside of the guide bushing.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41495

**A. CLASSIFICATION OF SUBJECT MATTER**IPC(7) : B26F 1/14  
US CL : 83/686, 698.91

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 83/686, 698.91, 696, 697, 684

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,141,264 A (WEISBECK) 27 February 1979, col. 3-10.	1-8
Y	US 4,440,052 A (WEISBECK) 3 April 1984, col. 4-10.	1-8
Y	US 5,752,424 A (ROSENE ET AL.) 19 May 1998, col. 3-9.	1-8
Y	US 6,463,839 B2 (OHTSUKA ET AL.) 15 October 2002, col. 2-6.	1-2, 4, 6, 7 and 8
Y	US 2,172,272 A (P. BOOTH) 5 September 1939, col. 1-3.	1, -4, 7 and 8
Y	US 5,884,546 A (JOHNSON) 23 March 1999, col. 3-8.	9-10
Y	US 6,276,247 B1 (HELDA) 21 August 2001, col. 3-6.	9-10

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See patent family annex.

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